

# INVESTIGATOR'S ANNUAL REPORT

## National Park Service

All or some of the information provided may be available to the public

<b>Reporting Year:</b> 2003	<b>Park:</b> Shenandoah NP
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<b>Permit#:</b> SHEN-2001-SCI-0017	
<b>Park-assigned Study Id. #:</b> SHEN-00265	
<b>Project Title:</b> ASSESSMENT OF VEGETATION COMMUNITIES IN RELATION TO ECOLOGICAL UNITS WITHIN SHENANDOAH NATIONAL PARK	
<b>Permit Start Date:</b> Jan 01, 2001	<b>Permit Expiration Date</b> Sep 30, 2004
<b>Study Start Date:</b> Jan 01, 2001	<b>Study End Date</b> Sep 30, 2004
<b>Study Status:</b> Continuing	
<b>Activity Type:</b> Research	
<b>Subject/Discipline:</b> Plant Communities (Vegetation)	
<b>Objectives:</b> <p>The overall objective of this project is to assess the distribution of vegetation communities in SHEN in relation to ecological units defined by terrain and landscape structure. Supporting and concurrent objectives include 1) classification of vegetation communities into a USNVC schema using data collected at field plots, 2) research and development of ecological gradient models based on terrain analysis, 3) investigations of newly available remote sensing technology for mapping vegetation to the USNVC, 4) construction of a statistical model that predicts the distribution of USNVC vegetation classes from field plots, terrain-based ecological gradient models, and vegetation spectral responses mapped from satellite imagery, 5) model and delineate riparian and wetland areas of the park, and 6) conduct a statistically valid accuracy assessment of vegetation classifications and ecological models.</p>	
<b>Findings and Status:</b> <p>Project activities continued on schedule for FY03. Progress was made in the following areas during FY03: 1) Remote sensing: We completed orthorectification of 154 1:24,000 aerial photos being used as a primary data source for this project. We also completed orthorectification and correction of Landsat satellite imagery to prepare for image interpretation and modeling. Through a cooperative agreement with the University of Maryland, Appalachian Laboratory, we completed atmospheric and ortho-correction for AVIRIS hyperspectral imagery covering the park. All image sources have now been acquired and preprocessed into a format useable for GIS-based spatial modeling. 2) Veg. Classification: We also continued vegetation community data analysis in FY03. Vegetation community (e.g USNVC) descriptors of 34 veg types (including forested, open, and wetland communities) were classified by Va. Natural Heritage using data collected from 311 plots. Natureserve also delivered "Ecological System Unit" aggregations of the plant associations for SHEN to use for mapping purposes. 3) Field sampling: We placed an additional 19 vegetation plots in the park with the Va. Natural Heritage using the Natural Heritage plot protocol in ecological communities undersampled in previous years to solidify the vegetation community classification. Fire fuels data were collected at these plots concurrently by NPS personnel. Va. Natural Heritage separately collected data at an additional 26 plots in the park to finalize the classification scheme. We also visited an additional 19 plots with cooperators from the University of Maryland, Appalachian Laboratory to examine areas that appeared anomolous on satellite and aerial imagery. Aside from accuracy assessment by Va Natural Heritage, all field data collection for this project is now complete. 4) Predictive vegetation modeling: We continued research into predictive vegetation modeling of individual species found at field sites using variables gleaned from GIS-based spatial models. We applied methods for applying Mahalanobis distance predictor models using techniques developed jointly with Dr. Frank van Manen (USGS) for a parallel study</p>	

of rare plant distribution in the park. This technique and Classification and Regression Tree (CART) methods are being applied in FY04 to predict individual distributions of indicator species, and to predict the composition of vegetation communities from GIS-based environmental gradients and spectral data from satellite imagery. Draft maps are expected in the spring of 2004 for review and field validation.

**For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?**

No

**Funding provided this reporting year by NPS:**

0

**Funding provided this reporting year by other sources:**

88000

**Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college**

**Full name of college or university:**

n/a

**Annual funding provided by NPS to university or college this reporting year:**

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